



# NASA Procedural Requirements

**COMPLIANCE IS MANDATORY**

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**Subject: NASA Science Management**

**Responsible Office: Science Mission Directorate**

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## Chapter 3. Quality Assessment Process and Performance Measurement Metrics

### 3.1 Background Information

3.1.1 As stated in this document, NASA shall make extensive use of expert review panels to assess the quality and performance of its science programs. The peer review process shall follow the recommendations of the National Academy of Sciences (NAS) in the report entitled Implementing the Government Performance and Results Act for Research using quality, relevance, and leadership as evaluation criteria for the research programs. Quality is a measure of the degree of excellence of the research and its potential to advance knowledge, as well as its rank in a particular field of research. Relevance is an indicator of how well integrated the research is to the goals and objectives of NASA's strategic plans and roadmaps. World leadership in science can be evaluated through international benchmarking using national and international experts. Quality of research is commonly evaluated by peer review. Selection of peer review panels follows the criteria recommended by OMB as specified in Section 2.3.4 of this document.

3.1.2 In May 2002, the Office of Science and Technology Policy and OMB issued a memorandum describing criteria for assessing Research and Development (R&D) Programs, based on the NAS's document described above.

The criteria specified in the memorandum require that managers of R&D programs demonstrate the extent to which their programs meet the following three tests:

- Relevance R&D programs must be able to articulate why this investment is important, relevant, and appropriate. Programs must have well-conceived plans that identify program goals and priorities and identify linkages to national and "customer" needs.
- Quality R&D programs must justify how funds will be allocated to ensure quality R&D. Programs allocating funds through means other than a competitive, merit-based process must justify these exceptions and document how quality is maintained.
- Performance R&D programs must have the plans and management processes in place to monitor and document how well this investment is performing. Program managers must define appropriate outcome measures and milestones that can be used to track progress toward goals, and assess whether funding is to be enhanced or redirected.

The R&D criteria address not only planning, management, and prospective assessment but also retrospective assessment. Retrospective review of whether investments were well-directed, efficient, and productive is essential for validating program design and instilling confidence that future investments will be wisely made. Retrospective reviews should address continuing program relevance, quality, and successful performance to date.

3.1.3 NASA demonstrates compliance with these criteria in the Integrated Budget and Performance Document. NASA internal reviews of research programs include annual project- and program-level assessments at NASA Centers, contractor sites, and NASA Headquarters. For external review, NASA relies on panels of scientific experts to ensure that science proposals are reviewed and selected on the basis of scientific merits. The NASA Advisory Council, National Research Council, and National Academy of Science may perform additional reviews.

3.1.4 Several mechanisms are used to measure the performance of the NASA science programs. Some of the mechanisms are Governmentwide mandates, such as GRPA and PART (Sections 3.3 and 3.4), and are reported annually. Because the outcome of scientific research may be difficult to evaluate on a short-term basis, a retrospective assessment covering the previous 2 to 3 years shall be used to provide a more complete and accurate indicator with respect to the quality, relevance, and performance of the research. A retrospective assessment can be used as a metric to indicate progress along the science program roadmaps. Looking at the inputs provided, the outcomes achieved, and the values of those outcomes to the science community determine performance measurements. Each Mission Directorate sponsoring scientific research shall select metrics to be used in its performance assessment report and coordinate the assessment with the appropriate advisory group, such as the National Research Council or the NASA Advisory Council and its committees.

## **3.2 Responsibilities**

The MDAA's are responsible for conducting the assessment of their science and research programs, using the current R&D investment and other criteria, and for collecting and submitting performance metrics to the NASA Chief Financial Officer and the NASA Chief Scientist for review.

## **3.3 Reporting Requirements**

3.3.1 At the beginning of the fourth quarter of each Fiscal Year, MDAA's shall submit the following information to the NASA Chief Scientist:

- a. Number of BAAs and CANs issued during the Fiscal Year.
- b. Number of proposals received during the Fiscal Year in response to BAAs and CANs.
- c. Number of unsolicited proposals received during the Fiscal Year.
- d. Total number of proposals selected, the number of proposals selected using peer review during the Fiscal Year, distributed by whether the proposals were submitted in response to a BAA, CAN, or were unsolicited.
- e. For the Fiscal Year, the number of participating institutions represented by Principal Investigators and Co-investigators who submitted and who were selected, broken down whenever possible by state.
- f. For the Fiscal Year, the number of proposals selected from different sources, broken down by NASA intramural, industry, academia, other non-profit organizations, other Federal agencies, and other Governmental (non-Federal) agencies.
- g. For the Fiscal Year, the budget available for sponsored research, the budget disbursed for peer-reviewed proposals, and the budget disbursed for proposals not peer reviewed.
- h. For the Fiscal Year, average funding per award.

3.3.2 A compilation of these statistics shall be reported as part of NASA's annual performance report.

## **3.4 Evaluation of Science Programs under the GPRA**

The GPRA requires the following activities: an Agency-level strategic plan that sets goals and objectives, an annual performance plan that translates goal into annual targets, and an annual performance report that demonstrates whether targets are met. Each of the Mission Directorates submits a report on annual performance goals, based on its strategic plans, for review by the NASA Chief Financial Officer and OMB before it is sent to Congress as mandated by GPRA.

## **3.5 The Program Assessment and Rating Tool (PART)**

3.5.1 The PART is a systematic method of assessing the performance of program activities across the Federal Government. OMB uses PART assessments to help link performance to budget decisions and to provide a basis for making recommendations to improve program results.

3.5.2 The PART is composed of a series of questions requiring objective data and evidence to assess programs across a range of issues related to performance. Although most PART questions are the same, there are several different versions of the PART that ask additional questions unique to a particular type of program (such as R&D, competitive grant). PART questions deal with program purpose and design, strategic planning, program management, and program results. The use of appropriate performance measures is a key component of the PART assessment.

3.5.3 NASA applies the PART tool to individual Themes and OMB assesses each Theme once every three years. Results of PART assessments, including OMB recommendations for improvement, are published each year with the President's budget request.

### 3.6 Retention of Records

All documentary information, regardless of format, made or received in the course of conducting NASA science programs are Federal records and shall be maintained, safeguarded, and dispositioned in accordance with the guidelines of NPR 1441.1, NASA Records Retention Schedules.

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